



LUND  
UNIVERSITY

# Annual Report

LUND UNIVERSITY HUMANITIES LAB | 2020





THE DIRECTOR'S WELCOME .....	3
THE DEAN'S INTRODUCTION.....	4
STEERING COMMITTEE AND ORGANISATION.....	5
BRIEF FACTS.....	6
THE COVID-19 PANDEMIC.....	8
RESEARCH.....	10
COLLABORATIONS.....	25
TRAINING, TEACHING, CONSULTATION.....	30
VISIBILITY, ACCESS, OUTREACH.....	32
STAFF MEMBERS 2020.....	36
FUNDERS 2020.....	39

## The Director's welcome

Welcome to the Annual Report of Lund University Humanities Lab for 2020. The Lab is a research infrastructure at Lund University open to researchers, teachers, and students across Lund University and beyond. We host technology, methodological know-how, data management and archiving expertise. Lab activities evolve around issues of culture, communication, and cognition – traditional domains of the Humanities – but many projects are also interdisciplinary and conducted in collaboration with the Social sciences, Medicine, the Natural sciences, Engineering, and e-Science. The Lab enables researchers to combine traditional and novel methods, and to interact with other disciplines. We provide training in hosted technologies and related methods through courses and tutorials, seminar series, and demo sessions. We are also an arena for contact and collaboration between academia and stakeholders in education, industry, health, and cultural institutions, and we act locally, nationally, and internationally.

The Lab year 2020 was dominated by the Covid-19 pandemic and its effects on education and research. Importantly, however, despite the semi-lockdown of the Lab in March 2020, Lab activities continued during the year, as this Annual Report will highlight. In an amazingly rapid shift to an online modus operandi, new users and projects found the Lab, and continued research activities and creative work. The Lab offered courses, tutorials, consultations, and seminars online. New Lab members were recruited to launch work on mobile app technology for research, a timely development given the pandemic. The Lab also became a Metadata Providing Centre in the European consortium for language technology, CLARIN, meaning that our language resources are now indexed and visible world-wide. The Lab was also awarded competitive funding from Lund University to develop text and language technology further in the Lab, a domain in which we see rapidly increasing demand for expertise from many disciplines. We are deeply grateful for this support.

In 2020 all research at Lund University was assessed in a big (digital!) research evaluation, the so-called RQ20. The Lab was assessed among other research infrastructures at LU and compared to international standards with a very positive outcome. Relatedly, the Lab was ranked as a research infrastructure of national interest in the so-called needs inventory bid organised by the Swedish Research Council.

This Annual Report 2020 showcases a selection of Lab activities during the Covid-19 year, highlighting that the Humanities Lab remains a dynamic and exciting environment where researchers can tackle scientific challenges – even under the most adverse of circumstances!

Marianne Gullberg  
*Director of Lund University Humanities Lab*



# The Dean's introduction

Since its opening in 2007, Lund University Humanities Lab has inspired scholars in the Humanities and Theology to diversify and develop new approaches to challenges encountered in their research. Many of our disciplines now rely on the Humanities Lab as a fundamental component in their research with an increasing emphasis on digital tools, computational power, mixed methods, and interdisciplinary collaborations. A leading research and training facility, the Humanities Lab has become a key infrastructural unit at Lund University. It is now categorized as a university-wide infrastructure, reflecting its role for researchers and students in Humanities and Theology, but also across campus and beyond. Researchers from all over the world collaborate with colleagues at and through the Lab. The Lab's standing was highlighted in 2020 in Lund University's research quality assessment, RQ20, as well as in the Swedish Research Council's ranking of the Humanities Lab as an infrastructure of national interest in its national needs inventory 2020. In sum, Lund University Humanities Lab is a dynamic interdisciplinary research unit where scholars and students come together in a highly productive research environment. The Joint Faculties of Humanities and Theology are proud to host Lund University Humanities Lab.

Johannes Persson  
Dean of the Joint Faculties  
of Humanities and  
Theology



## Steering committee and organisation



### ORGANISATION

The Lab functions as an autonomous department, sorting directly under the Joint Faculties of Humanities and Theology. It is led by the Director, who is also the Chairman of the Steering committee. Organisationally, research in the Lab is of two kinds. Most research in the Lab is conducted by scholars whose research grants and groups are located in their home departments. These scholars come to the Lab to conduct their empirical studies using Lab equipment and resources, and then return to their home departments. The Lab also hosts its own externally funded research projects focusing on infrastructure.

#### Director – Marianne Gullberg

Marianne Gullberg is professor of Psycholinguistics at the Centre for Languages and Literature. Her fields of expertise include adult second language acquisition, bilingual acquisition and processing, and gesture production and comprehension in acquisition. She previously headed a research group on multilingual processing at the Max Planck Institute for Psycholinguistics with Prof. P. Indefrey, and is a co-founder of the Nijmegen Gesture Centre with Prof. A. Özyurek, the first of its kind. Her current research targets multimodal bilingual language processing, the earliest stages of implicit language learning, and bimodal discourse cohesion. She is a Wallenberg Scholar.

#### Deputy director – Victoria Johansson

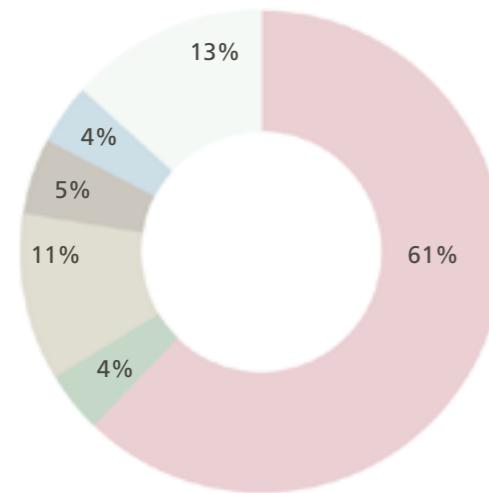
Victoria Johansson is associate professor and senior lecturer of Linguistics at the Centre for Languages and Literature. Her research focuses on language development through the lifespan, with special focus on language production and writing development, including developing research methodologies using keystroke logging and eye-tracking.

#### Research Engineer – Stefan Lindgren

Stefan Lindgren is a research engineer in the Lab with special responsibility for technology and procurement. His particular expertise lies in 3D data, motion capture, and Virtual Reality. In this, he works closely with archaeologists and historians, but also cognitive scientists, and linguists.

#### Administrative Coordinator – Maja Petersson

Maja Petersson is administrative coordinator in the Lab. She is responsible for monitoring action plans, policy, and procedure to optimise project management in the Lab. She is also responsible for communicating about the Lab internally and externally.



USERS' AFFILIATION BY  
FACULTY IN 2020 (%)

- Joint Faculties of Humanities and Theology
- Faculty of Engineering
- Faculty of Social Sciences
- Faculty of Medicine
- Faculty of Fine and Performing Arts | Faculty of Science
- National & international universities, private sector



## Research Quality Evaluation 2020, RQ20 – an assessment of infrastructures

In 2020 the [Research Quality Evaluation 2020 \(RQ20\)](#), a major research quality evaluation at Lund University, took place, the latest in a suite of assessments over the last two decades. Rather than evaluating research quality per se, RQ20 focused on the preconditions for research quality and the potential for development. Therefore, in addition to the traditional discipline-specific panels, RQ20 also assessed research infrastructures, which are part of the preconditions. For the first time, LU Humanities Lab was evaluated as an infrastructure along with other infrastructures at LU. Extensive self-assessments were submitted to the panel, and site visits then followed by video link on Zoom due to the pandemic. In the final report, the Lab was described as "a driver for new research" (RQ20 report, p. 775), and its ranking as an infrastructure of national interest by the Swedish Research Council was further highlighted.

**”**  
*...an exemplary case of good infrastructure that works universally – for and with other faculties*  
*(..ett föredömligt exempel på god infrastruktur som dessutom fungerar universellt – för och med andra fakulteter)*

*(Lunds universitets magasin, I, 2021)* **”**  
*Lund University Magazine I, 2021*

## Communication, systems administration, and work flows

Despite Covid-19 a number of major updates and developments were undertaken in the Lab infrastructure in 2020. The Lab's website was entirely re-designed with profound changes behind the scenes following a shift in Lund University's graphic profile, and national accessibility legislation (Petersson). In addition, a Swedish-language version of the entire website was created. The structure for project management, and the Lab's booking systems were also redesigned and moved to the systems maintained by the IT unit at the Joint Faculties of Humanities and Theology (Petersson). Lab members also worked on a new system for facilitating the creation and documentation of work flows (pipelines) for different Lab facilities (Garde, J. Larsson). The idea is to build resources that enable users to plug-and-play in any facility.



## The Lab in the year of the Covid-19 pandemic

On the 13 of March 2020 all in situ Lab activities had to be suspended as a consequence of the spread of the SARS-CoV-2 virus and the Covid-19 pandemic. Almost over night all Lab members moved to predominantly or entirely working from home. While keeping with the new regulations at Lund University for activities on campus, the Lab developed new guidelines and safety protocols in order to keep as many facilities as possible operational over the course of the year. The guidelines concerned everything from a cap on the number of individuals per room, and different enter and exit routes to facilities, to guidelines for disinfecting spaces and equipment, booking procedures, and strict protocols for screening participants before visits to the Lab, and contact routines in case of contagion post-visit.

Despite the challenges, Lab members showed enormous creativity and resilience in turning challenges into opportunities. Courses, tutorials, and consultations went online immediately, and were offered online throughout the year, creating wonderful resources for future use after the pandemic in the process. Many research projects and plans had to be re-designed to enable online data collection, and Lab members were instrumental in helping users re-design and re-create their studies to online formats. Since the normally frequent demos and Lab tours could not take place in situ, several virtual versions were developed, both live tours on Zoom, and pre-recorded options. Again, these solutions have created useful resources that expand the options and contact surfaces with new users also for the future.

The Lab is normally a highly interactive place, and work in the Lab has obviously been different with everyone working from home. Nonetheless, through weekly Lab meetings on Zoom and frequent use of Microsoft Teams for instant chatting, problem solving, and coffee breaks, walk-and-talks in the Botanical Gardens, and outside lunch meetings, the Lab has maintained a remarkable sense of community and togetherness throughout the year, even with newly recruited Lab members. It speaks volumes to the positive can-do attitude of the Lab community.



### OUR COVID YEAR

Diederick C. Niehorster and Marcus Nyström, the Humanities Lab, Ignace Hooge and Roy Hessels, Utrecht University, the Netherlands.

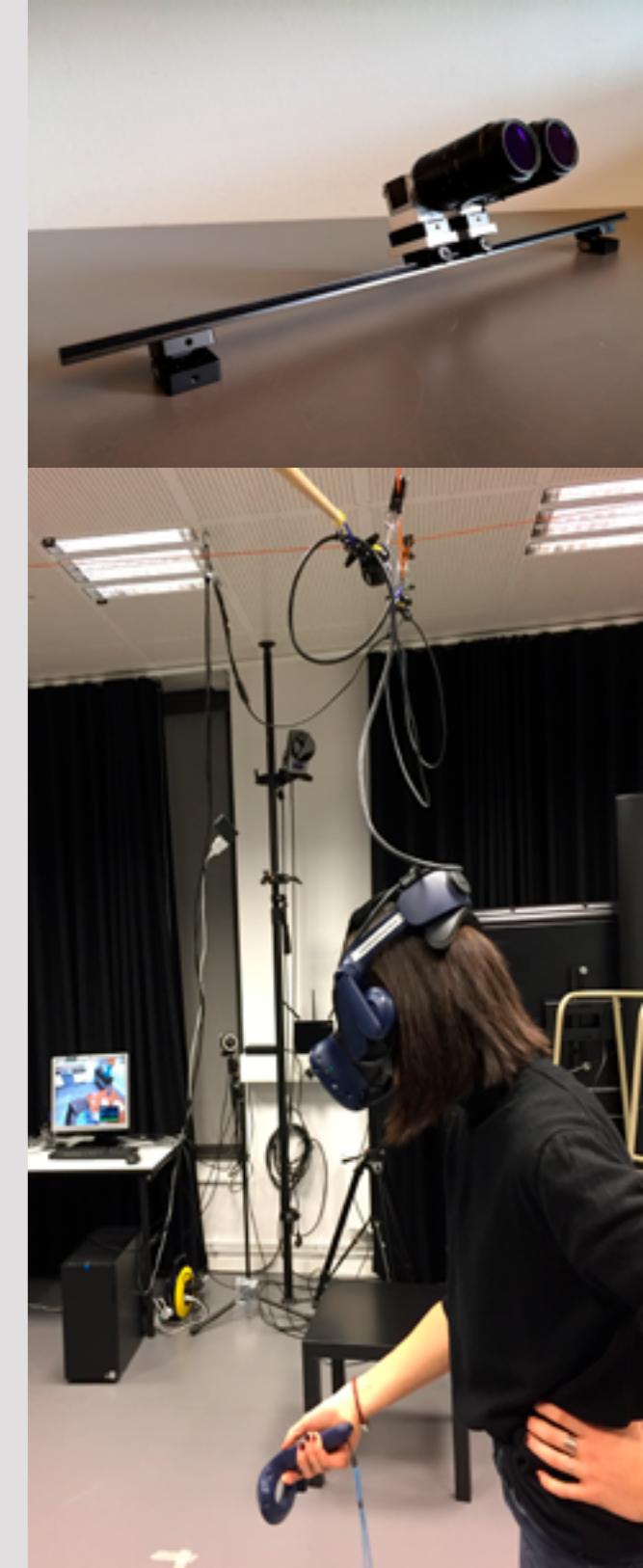
During 2020, we developed a new eye-tracker called FLEX (figure top right). This new eye-tracker is custom-built and flexible and fully open source. It is developed to be able to answer questions about eye movements and eye-trackers that commercial, 'black box' setups cannot. This was always the plan, so luckily we were not affected by the pandemic.

Katarzyna Bobrowicz, Psychology

I spent the pandemic year expanding my network and acquiring new skills in the Lab. I want to run an eye-tracking study on babies once the pandemic ends, so we worked out an experimental setup for that. The monitor and the eye-tracker are mounted on a very particular TV-tripod with adjustable height and tilt angle. I also practiced eye-tracking with the Tobii Spectrum Pro system, and measuring heart rate with the Biopac systems.

Lara Langensee and Johan Märtensson, Logopedics, phoniatrics and audiology

The pandemic ruled out our original plans to collect data for a study on adult foreign language learning using a virtual kitchen to teach participants Mandarin words. So instead we worked on making our VR-setup more covid-friendly – with invaluable help from Henrik Garde in the Lab. The results of our efforts can be seen in the image to the right. We can now collect VR-data with the experimenter and participant at a safe distance from each other.



# Research

This section presents a selection of the research activities in the Humanities Lab in 2020, the year of covid-19 and semi-lockdown. It aims to give a flavour of the scope, breadth, and interdisciplinarity of the work done in the Lab. It also highlights that research thrived despite the challenges imposed by the pandemic.

## TEXT-LANGUAGE RESOURCES, SWE-CLARIN

Most scholars in the Humanities and Social Sciences work on and with text in various formats, but interest in the use of computer-based tools for text analyses is growing beyond these disciplines. There is now substantial interest in OCR technology to enable the search and tagging of scanned texts, and in sophisticated tools for searching, processing, and analysing texts, or for creating corpora (structured and annotated collections of materials).

LU Humanities Lab is a member of the Swedish national consortium for language resources and technology, *Språkbanken & Swe-Clarin* (see [National and international collaborations](#)). This national e-science consortium, funded by the Swedish Research Council until 2024, is itself a part of the European Research and Infrastructure Consortium *Common Language Resources and Technology Infrastructure (ERIC CLARIN)*. CLARIN provides access to (contemporary and historical) language-and-text-based material, and to tools for exploring and investigating such data. Since 2017 the Humanities Lab is a certified CLARIN Knowledge Centre, specialising on multimodal and sensor-based language data. In 2020 the Lab also became a CLARIN Metadata Providing Centre

(C-centre), meaning that the Lab now provides so-called CMDI metadata via the Corpus server to CLARIN's Virtual Language Observatory (VLO). The CMDI (Component MetaData Infrastructure) is an initiative for a more general and reusable metadata standard and is the official metadata standard in CLARIN. The VLO was developed as a tool for discovering data, tools and services available in CLARIN and related communities. Språkbanken and Swe-Clarin held two national consortium meetings online in 2020 (Frid, Gullberg).

The Lab supports and collaborates with many projects guided by the local coordinator (Frid). In 2020 Swe-Clarin resources were involved in several ongoing projects providing data analysis and visualisation expertise. This includes continuing projects, such as the *Diachronic Atlas of Comparative Linguistics* (Linguistics; Carling), which aims to develop and maintain an open access database with lexical and grammatical data from 500 languages from 18 language families. This project was featured at the [Tour de CLARIN blog in 2020](#). Another continuing project is PROGEST (the Royal Institute of Technology; House, Frid). This project uses articulography, motion capture and acoustics to investigate the relationship between head movements, articulation and prosody, such as the synchronization of head movements and prosodic boundaries. Swe-Clarin organised a web-based data collection environment and contributed to data recording and data analysis. The Swe-Clarin group *Benchmarking Swedish Named-Entity Recognition and Classification* brings together Swe-Clarin nodes at Lund, Gothenburg and Linköping. The aim of named-entity recognition

is to develop a tool for finding and replacing Swedish names in written materials in order to anonymise (or 'pseudonymise') them. In 2020 the project introduced a gold standard resource with texts from different genres including social media. Frid and other Lab members also participated in an Advanced Study Group at the Pufendorf Institute for Advanced Studies called *In the interest of the nation*, which examined the role of language for intelligence analyses (Petterson [coordinator], Frid, V. Johansson, van de Weijer).

Swe-Clarin resources were also engaged in training and consultancy. The Lab hosted online and in situ tutorials on text mining methods (Frid), and participated in a workshop on Method and Methodologies hosted by the Faculty of Social sciences, LU, in collaboration with the graduate school COMPUTE, where introduction was given to natural language processing and text mining (Frid). Consultations were also numerous and included providing advice on text mining and the analysis and visualisation of various types of linguistically associated

data. This included speech anonymisation, part-of-speech taggers, information extractions of mentions of diseases and chemical substances in medical journal papers, and text mining to find discursive and rhetorical strategies in Flashback threads.

## DATA MANAGEMENT AND CORPORA

Corpora are structured and often annotated collections of materials. The corpus server in the Lab is a facility for long-term, secure storage of such data. It functions both as an archive and as a collaborative workspace, with options for dynamic data management to upload, edit, and enrich data and metadata. Metadata are publicly visible, browsable, and searchable through the corpus browser, while the actual data are password-protected. Data access is granted by data owners/depositors at four access levels. The corpus server thus enables data discovery, and serves as a means to connect and collaborate with researchers responsible for relevant collections. The



server provides an environment for any digital data, new and old.

In 2020, work continued on existing projects. This included the project *Language as key to perceptual diversity* (LANG-KEY; Burenhult) which explores how languages express sensory experience with a focus on endangered speech communities. The project develops innovative field techniques such as the use of action cameras with built-in GPS for documenting spatial language and behaviour, and new analytical frameworks (J. Larsson, Burenhult). In 2020 the project team focused on dissemination.

Work also continued on the project *Repository and Workspace for Austroasiatic Intangible Heritage RWAII* (Burenhult, Kruspe, Frid, Ravn, J. Larsson). RWAII is a multimedia resource committed to the preservation of collections documenting the languages and cultures from the Austroasiatic language family of Mainland Southeast Asia and India. Swe-Clarin tools for text recognition of handwritten field notes and automated audio transcriptions were used to enable spatial information from handwritten field notes from the 1960s to be imported and georeferenced with Geographic Information Systems data (GIS data; Frid). Equally, archived material from the language Khmu, especially song-transcriptions, was modernised and included in the repository. Further work included automatizing the conversion of older transcriptions with timestamped audio files into transcriptions adapted to the software ELAN. RWAII also worked on a collection from the Nicobar Islands (located in the Andaman Sea to the west of Thailand) for a future archiving. The language and culture were documented extensively by human-ecologist Simron Singh (1990s-2009), and the collection covers both material and immaterial culture

from before and after the 2004 tsunami which forever changed the Nicobar communities and the surrounding landscape.

New data sets included material on Papuan languages, especially Kalamang, spoken on the Karas Islands, connected to a PhD project in Linguistics (Visser). New material was also added from a Marie Skłodowska-Curie post-doc project which investigates how people describe their surroundings multimodally when they are on the move (Mesh). Action cameras are used to record speakers of Chatino (an indigenous Zapotecan language of Mexico) when they use speech and gestures during wayfinding on mountainous trails.

### AUDIO AND VIDEO FACILITIES

The LARM studio provides professional audio and video recording facilities as well as a set of musical instruments.

Although the studio was also affected by the semi-lockdown in 2020, continuing work included a project in History of ideas and sciences which aims to record and animate the Bach piece *Trinity in Prelude, Fugue and Allegro* in the studio (Eklöf). A continuing EU-funded project in Historic archeology, *ArcheoBalt* (Gdansk, Aarhus, Lund, Bornholm) used the facility to record and edit video material to present the archeological excavations at Uppåkra (M. Roslund, Dell'Unto). Another project continued to investigate how a blind audience receives and experiences audio descriptions of visual events, a phenomenon known as audio description (Holsanova, R. Johansson, Lyberg Åhlander). A new project in Cognitive science, *Interactions and learning with parallelograms* (Ternblad), involved the recording of sound material, and a MA project in Linguistics collected data for a study



investigating second language word production (Ramírez Maraver, Roll).

Several scientific podcasts series made use of the studio to record episodes in 2020, such as the science podcasts of the Joint Faculties of Humanities and Theology (Degrell), *Bildningspodden* from Stockholm University (Bremmer), and *En filosofs liv och tankar*, Philosophy (Jönsson, Eriksson). The studio was also used for recording audio material for the project *Kartan över oss* by the Swedish National Touring Theatre (Riksteatern) in collaboration with the think tank *LU Futura* (Cronqvist). In addition, the national Swedish Radio regularly used the studio for interviews with researchers at LU (e.g., *P1 Historia*).

Academic courses in Musicology (M. Johansson) also used the studio as a basis for teaching along with Theology and Religious Studies (Maurits, et al.), often in the form of podcasts, for instance for the course *After Me-too - The Struggle for Recognition in History and Today*. Finally, tutorials on audio recording were also organised in 2020 both on site in the studio and online from March onwards during the semi-lockdown. Demos of the facility were also offered to students from Digital cultures (P. Roslund).

The anechoic chamber, which enables top quality audio recordings, was used in 2020 for consultancies on how to record and demonstrate differences in Swedish and Danish for a planned exhibition at Kulturen's Museums, Lund (Schötz). Further, the facility was also used for teaching at the program for Speech and language pathology.

### 3D SCANNING, VIRTUAL REALITY (VR)

The use of 3D and Virtual Reality techniques continued to develop in 2020 with a focus both on data acquisition and method development.

Projects involving 3D scanning included the scanning of the historical building in the open-air museum Fredriksdal, Helsingborg. The study aimed to establish scan procedures that may be used for sustainable cultural tourism and for saving cultural heritage (Architecture; Pålsson Skarin, Landeschi, C. Larsson, Lindgren; see [User projects p. 16](#)). Other scanning projects involved the 3D scanning of a dinosaur fossil (Geology; De La Garza), the examination of the shipwreck known as *Gribshunden* located close to Stora Ekön near Saxemara in Blekinge (Archaeology, Blekinge Museum). The Lab assisted with 3D-scanning and expertise when recording the gun carriages recovered from the wreck. From these, a digital reconstruction was made (C. Larsson). Lab members also continued their engagement in the so-called Faliron project run by the Swedish Institute in Athens, which aims to 3D-scan an ancient mass grave in Athens. Lab members provided advice on how to publish fieldwork data, and helped refine the 3D data (Landeschi, C. Larsson). Other continuing projects included the Hermione project, also with the Swedish Institute in Athens, where Lab members work to create a plan of the ancient city of

Hermione, Greece (Lindgren, Landeschi). In 2020, work focused on converting and exporting a collected dataset to new formats. Finally, work in the monastery church at Vadstena also continued in 2020, in collaboration with Uppsala University and Technical geology at LU (Lindgren, Lindqvist Sandgren, Ask, Rossi).

Immersive virtual reality with headsets allowing users to experience virtual 3D worlds were used in a range of projects. A PhD project in Archaeology combined VR eye-tracking with GIS to explore how people allocate visual attention in virtually reconstructed spaces such as Pompeii (Campanaro, Landeschi). A PhD project in Speech and language pathology examined the training of Mandarin vocabulary in immersive virtual environments (Langensee, Mårtensson, M.Gullberg, Garde). Consultancy on VR headsets also included the School of Aviation, LU (Tyllström, Garde) and a project in Cognitive science (Roszko, Garde).

In 2020, Lab members developed digital teaching material for Virtual Reality in Archaeology (C. Larsson). They also held demos of the VR headset with built-in eye-tracker, Varjo VR-2 Pro, for the School of Aviation at LU (Tyllström, Garde, Niehorster). Lab members also organised an online tutorial for the SAXO Institute, University of Copenhagen, as part of its Masters program in Archaeology (Landeschi). 3D modeling was also presented at a lecture given at the Max Planck Institute 'Bibliotheca Hertziana' in Rome on the theme of digital models in Art history (Landeschi).

In 2020, the facility was upgraded with Cognitive3D, a software solution for analyzing human interaction in a VR environment through formal assessment of the user's visual experience. The software was tested in

combination with an eye-tracker (TOBII PRO HTC Vive VR headset; Landeschi, Campanaro). Further methodological work consisted of testing a VR headset with built-in eye-tracker (Varjo VR-2 Pro), designed for industry and research (Garde). A tracking station for different types of VR-headsets was also installed (Garde). The Lund University Center for Scientific and Technical Computing (LUNARC) provides access to computational resources needed for heavy data processing. In collaboration with LUNARC, the Lab tested the latest release of Agisoft Metashape, a software that generates 3D spatial data to be used in GIS applications (Landeschi).

### MOTION CAPTURE (MOCAP), VIRTUAL REALITY (VR)

Motion capture is another 3D technology that enables the recording of human bodily movements in 3D with high spatial and temporal resolution. As of 2020 the motion capture system consists of twelve high-speed infrared cameras and three high-speed video cameras linked to each other and a recording computer. The infrared cameras detect and record the 3D position of reflective markers strategically located on a moving individual's body.

A generous donation from Einar Hansens Allhemsstiftelse in 2019 allowed for a thorough upgrade of the motion capture systems, software, and server solutions in 2020. Thus, the Lab's mocap facilities now include motion and video cameras (two Miqus Video Cameras, and four Miqus Mocap Camera, M3), which improve the quality of the motion tracking substantially, and allows for more flexibility, such as running experiments outside of the mocap studio. Methodological development included the setup of a wifi system to synchronise signals with



external systems (Garde), and synchronisation of mocap and eye-tracking recordings (Garde, Niehorster, Hooge).

New projects in 2020 included a project with the Malmö Academy of Music, *Kurze Schatten III*, where hand movements during guitar playing were captured with mocap (Chavarria-Aldrete, Edgerton, C. Larsson, Garde, Lindgren; see [User projects, p 16](#)). A project at the Faculty of Engineering used mocap to help build a system that uses sound recordings from microphones to reconstruct how a person moves through a 3D space (M. Larsson, Åström, Flood, Oskarsson, Garde). A project with the University of Amsterdam explored whether mocap data can be used to animate avatars in museum exhibitions (Stoffer, C. Larsson, Lindgren). Mocap was also used to investigate whether mocap-based avatars can be used in virtual versions of clinical tests for ADHD or ASD in children (Rasmussen, P. Gustafsson, Ericsson, Kjell, C. Larsson, Garde, Lindgren).

A continuing project in 2020 was the EU-project *Cross-4Health*, a collaboration between Innovation Skåne and Kreativitetsbanken, in which the app Virtual Recovery aims to create an interactive 3D-game with a virtual personal trainer to help people train movements and measure their progress (Egnér, C. Larsson).

The Lab offered demos on the topic *Can we use motion tracking to make controlled manipulations of body language*, for Strategic communication, LU (Nothhaft, Garde), and a tutorial for the Swedish University of Agricultural Sciences, Alnarp (Cerwén, Garde). Lab members also offered consultations on the construction of the new MoRe Lab at the Forum Medicum, LU (Schmidt, Malesevic, Garde, Lindgren).

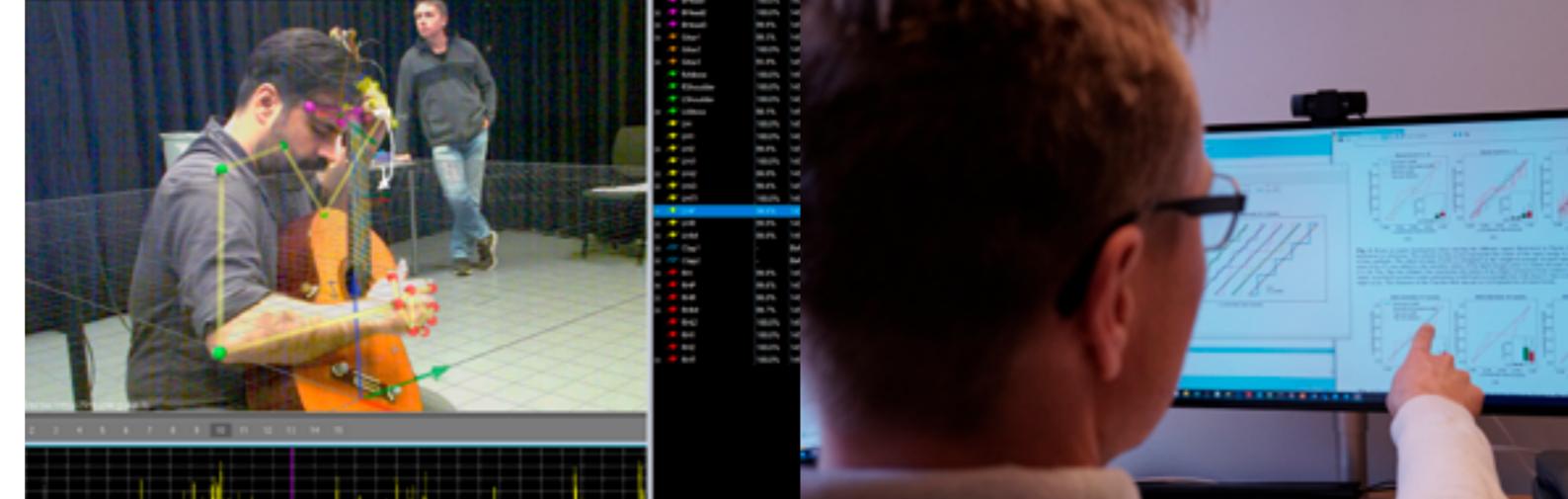
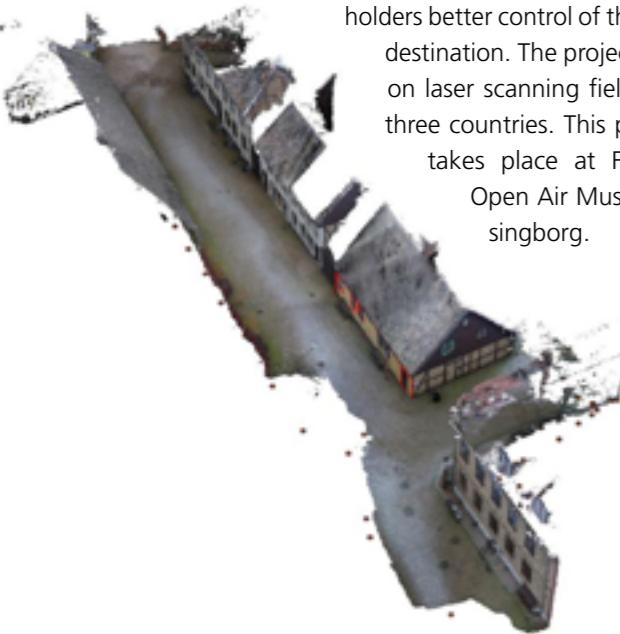
*continued on p 18*

# User projects

## ESTABLISHING A CITY SCAN PROCEDURE FOR SUSTAINABLE VIRTUAL TOURISM IN ORDER TO SAVE BUILT CULTURAL HERITAGE

Ingela Pälsson Skarin, Dept. of Architecture and Built Environment, Lund University | Giacomo Landeschi, Dept. of Archaeology and Ancient History/Lund University Humanities Lab, Lund University | Carolina Larsson and Stefan Lindgren, Lund University Humanities Lab, Lund University

This project uses laser scanning to explore the potentials of introducing Virtual Tourism by means of Augmented Reality to mitigate over-tourism and today's CO<sub>2</sub> emissions. Virtual Tourism could be a necessary paradigm shift for the tourism industry since its work pipeline, the City Scan Procedure (CSP), is constructed with the intention of giving local stakeholders better control of their tourist destination. The project is based on laser scanning field work in three countries. This pilot study takes place at Fredriksdal Open Air Museum, Helsingborg.



## KURZE SCHATTEN III - FROM SOUND TO MOVEMENT

Bertrand Chavarria-Aldrete, Malmö Academy of Music, Lund University

This project aims to create an archive of hand movements from music performance on the guitar. The material is extracted from motion capture recordings of the manual movements on the guitar during a performance of Kurze Schatten II. The motion capture data will form the basis of 'impossible avatars' that will serve as a choreographic score/guide for six dancers. They in turn will perform the impossible movements of the hands reconfigured onto their bodies. In this extension, the dancers' bodies are taken as a pure plastic performance of a music that will not be heard, creating a link between living elastic bodies and the mechanics that produce the sound; an extension of the body and thought of the performer in space, unveiled through motion capture technology.

## EFFECT OF EYE MOVEMENTS ON TRAUMA MEMORY

Sabine Schönfeld, Evangelische Hochschule Dresden/Dept. of Psychology, Lund University | Roger Johansson, Dept. of Psychology, Lund University | Marcus Nyström, Lund University Humanities Lab, Lund University

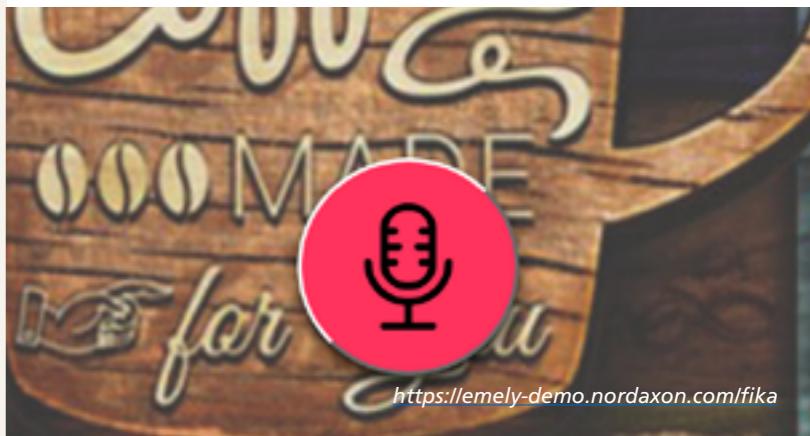
This project investigates the role of an individual's eye movements when forming and remembering distressing memories. Since previous research has highlighted the importance of eye movement behavior in the treatment of Posttraumatic Stress Disorder (PTSD), it is important to understand the underlying mechanisms and how they interact with other potential risk factors for PTSD. Preliminary results support the validity of using eye-tracking to investigate these phenomena and indicate interesting interactions between eye movements, memory experiences and individual differences in risk factors for PTSD.



## LANGUAGE TRAINING WITH CONVERSATIONAL AI

NordAxon, Malmö

The Malmö-based company NordAxon is developing a system for conversational AI (or a 'chatbot') to support language training. Using state-of-the-art language technology, it is possible to construct a system that allows users to interact and talk with different artificial interlocutors, such as a job interviewer or a 'fikakompis' (friend you meet for coffee). This gives users an opportunity to practice language skills by themselves. Lab members participate in a reference group for this project, reviewing the systems, and providing advice on language resources and dialogue management.



## ARTICULOGRAPHY

The Lab hosts electromagnetic articulography (EMA). This technique records the movement of the tongue, the lips, the jaws (so-called speech articulators) in 3D with high spatial and temporal resolution through sensor coils in an electromagnetic field.

Since no new data could be collected using the EMA facility during the semi-lockdown in 2020, work largely focused on updating checklists and user guides (Schötz, Frid). However, a pilot project was started with researchers from Malmö Academy of Music on how EMA can be used together with airflow measurement equipment and/or BioPac to study extreme voice singing (Edgerton, Brusoni, Schötz, van de Weijer). Further, a PhD project in Phonetics came to fruition in 2020 which had used EMA to explore the movements of the jaw during the articulation of Swedish word accents (Svensson Lundmark).

EMA was also used in the teaching of Phonetics, and Speech and language pathology (Schötz).

## EYE-TRACKING

In 2020 eye-tracking was used in a range of projects and training events, across many different disciplines, in national and international collaborations. The facility was also upgraded.

Eye-tracking was used in several projects. For example, a project with Malmö University used eye-tracking to study ethnic discrimination and 'colorblindness' in Sweden and abroad (Osanami Törngren, Nyström), and work with the Royal College of Music explored the relationship between eye movements, music perception, and exper-

tise (Timoschenko, Huovinen, Nyström). Other projects used the technology to investigate how readers handle so-called filter bubbles in google searches (Philosophy; E. Olsson, Ekström), whether people are aware of when their eye movements fail to reach their intended goal (Cognitive science; Roszko), how hunger influences decision making (Cognitive science; Gidlöf, Wallin), and the role of so-called scan paths (the movements of eyes across space and time) for memory (Psychology; R. Johansson, M. Johansson, Nyström, Dewhurst). Another project in neurophysiology examined whether pupil responses to light could be conditioned to occur also in response to sounds (Rasmussen, Niehorster). Other studies used eye-tracking to explore what developers do during code review, and how eye movements may help develop intelligent assistance and adaptive code analysis tools (Computer science and the Strategic Research Area ELLIIT; Niehorster, E. Söderlund).

A series of projects examined eye movements in their own right, for example, an ongoing study of the so-called 'quiet eye' effect, whereby experts look longer at a target than novices just before acting in a computerized task (Dahl, Nyström). In another project Lab members collaborated with Biomedical engineering and Clinical sciences to develop improved analysis tools for the diagnosis of nystagmus, a condition in which the eyes make repetitive, uncontrolled movements, leading to reduced vision with additional effects on balance and coordination (Rosengren, Stridh, Hammar, Nyström). Another study used the 7T MRI scanner, which is fitted with an eye-tracker, to study cerebral visual impairments after early brain damage (Diagnostic radiology; Lennartsson, Niehorster, Markenroth Bloch, Öhnell, Eklund, Rehn).

Methodologically oriented projects also flourished. Work



was conducted on new technology to measure the vestibulo-ocular reflex (VOR) in a collaboration between the Lab and the Vestibular lab at the Medical Faculty (Fransson, Nyström, Niehorster). A national study investigated eye-tracking as a potential tool to enhance hearing aids (Eriksholm Research Center; Shiell, Nyström, Niehorster, Skoglund). International projects included a project with Utrecht University and the company Eyegaze Inc. in the USA to study the accuracy of eye-tracker data (Hooge, Niehorster, Hessel, Cleveland, Nyström); eye-tracking-based feedback in educational contexts in the Netherlands and Germany (Kok, van Gog, Scheiter, Niehorster), and the development of eye-tracking for pilot training in flight simulators (the School of Aviation LU, the Emirates Airlines, the Institute for Energy Technology (IFE), Norway; Niehorster, Smoker, Dahlström, Hildebrandt).

In other activities, Lab members presented their work at the monthly meetings of the Ergonomics and Aerosol Technology (EAT) division at Design sciences (Nyström). They were also engaged in consultancy, for example on

what eye movements reveal about how flexible problem solving develops in young children's episodic memory (Cognitive science; Bobrowicz).

Facilities and Lab members were also engaged in several training events. The digital classroom was used for a training day on eye-tracking on campus for participants from LU (Niehorster, Nyström). Lab members also taught at several events such as an international workshop on mobile eye-tracking at the Max Planck Institute for Evolutionary Anthropology, Leipzig (Niehorster, Hessel, Benjamins), tutorials on screen-based and mobile eye-trackers, respectively (Niehorster, Nyström), and in two courses given in collaboration with Cognitive science and Design science (Niehorster). Lab members also co-developed an eye-tracking module in a course on *AI, Cognition and Culture*, at the department of Strategic communication (Niehorster, Holsanova).

In 2020 the eye-tracking facility was upgraded with a new VR headset with integrated eye-tracking (Varjo VR-2 Pro). Further, a custom-built, flexible eye-tracker, called FLEX, was developed together with Utrecht University, and the Helmholtz Institute, Utrecht (cf. p. 9). In contrast to other eye-trackers in the Lab, this one is fully open source, and is developed to be able to answer questions about eye movements and eye-trackers that commercial, 'black box' setups cannot (Niehorster, Nyström, Hooge, Hessel).

## ELECTROPHYSIOLOGY

Electrophysiological measurements of brain activity (EEG, ERPs) were important for several projects in 2020 despite the semi-lock-down. For example, work led by a Wallenberg Academy Fellow (Roll) started investigating



how vowels are processed in primary auditory cortex and how brain structure and phonological and phonetic proficiency may be related to each other (Fingerhut, Kochancikaite, Novén, Roll). An ERP study involving a BA student explored how phonetic and phonological correlates of Danish *stød* are used to predict upcoming forms of language (Hjortdal, Roll). Another study combined EEG with language technology to explore how semantic associations, orthographic neighbours (words that are orthographically similar to target words), and emotional arousal influence the amplitude of the so-called N400 component during a lexical decision task in Swedish (Blomberg, Roll, Frid, Lindgren, Horne). Another continuing project studied how Swedish speakers process quantified expressions such as *några studenter* ‘some students’ vs. *få studenter* ‘few students’ (Heinat, Klingvall). Results reveal that the type *få studenter* is ambiguous in a way that the type *några studenter* is not, and therefore gives rise to higher processing costs even in native speakers.

### MAGNETIC RESONANCE IMAGING (MRI)

Lund University Bioimaging Center (LBIC) hosts state-of-the-art MRI facilities to study brain anatomy and brain

function. In 2020 the Lab’s MRI liaison officer (Mårtensson), continued to forge stronger links between the Lab and LBIC. The MRI course that was developed during 2019 was adapted for online teaching during 2020 and saw the inclusion of additional teachers from LBIC. The course ran during autumn 2020 and added new users from Cognitive Science and Psychology who pursued projects using MRI with the help of staff from both the Lab and LBIC. Research with MRI connected to the Lab largely consisted of ongoing project and involved the neural underpinnings of perceived language anxiety in foreign language students (Abendroth, Mårtensson), and brain activity in highly suggestible individuals under hypnosis (Lindström, Cardeña). An ongoing PhD project in Neurolinguistics explored the connection between the aptitude for language learning and the brain’s anatomy, focusing on phonology (Novén). A new project intends to study embodied language learning using a combination of MRI and virtual reality (Mårtensson, Haake, Nilsson). The brain’s language network is expected to change to a larger extent when participants learn via hands, eyes and ears than through theoretical learning only.

### BIOPAC

The BioPac system measures a person’s psycho-physiological reactions to events in the surroundings such as loud sounds or visual input. The current system consists of a galvanic skin response unit, a respiratory unit, and a heart rate variability unit. In 2020, the system was used for a MA project in Cognitive semiotics in which participants’ experience of dance was studied. In this study, skin conductance and respiratory rate were measured while participants watched a video of a dancer performing classical ballet and contemporary dance. Participants were also interviewed about their experiences.

An interesting aspect of this study was not only that participants’ responses to the two types of dance could be compared, but also that the measurements could be correlated with the interview data (Chikladze, Zlatev, van de Weijer).

Lab members also trained visiting scholars from the University of Southern Denmark in Odense, Denmark, in how to use the Biopac system. Members also worked on updating the in-house manual and formatting it for online availability.

### MULTIMODALITY

Multimodal analysis of human behaviour (e.g., speech, gesture, head movements) continued to grow as a domain of investigation even if little new data were collected in 2020.

A range of studies examined crosslinguistic and cross-cultural aspects of speech and gestures. For example, MA projects investigated possible gender differences in spoken and gestured expressions of agreement in Greek (Rozou, M. Gullberg), and the relationship between intonation and gesture in Mandarin Chinese imperatives in dumpling cookery classes (Hu, M. Gullberg). A Marie Skłodowska-Curie Individual Fellowship continued to examine the use of demonstratives in speech (e.g. *this/that*) and pointing behaviour with hands, heads, and lips in speakers of Eastern Chatino, Mexico (Mesh). Another ongoing project involved a comparison of Swedish and Italian speakers’ use of gesture in storytelling (Graziano, M. Gullberg).

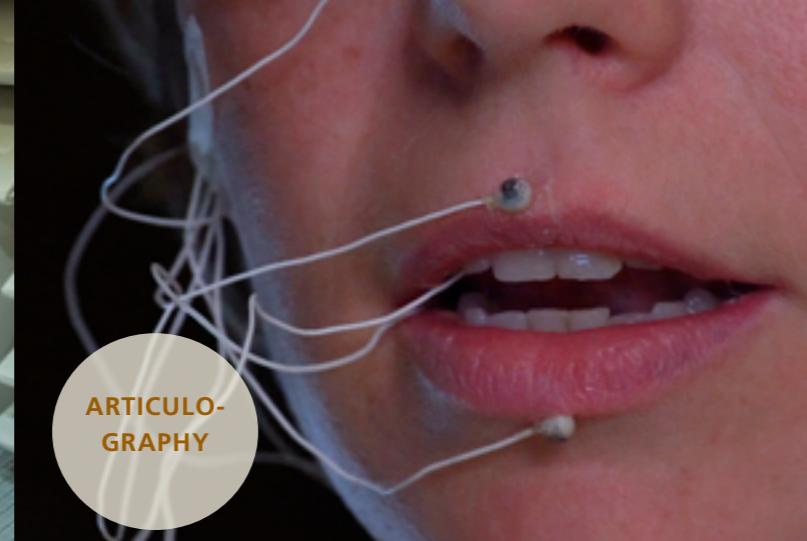
Other projects focused on multimodality in language acquisition or bilingualism. A new collaborative pro-



A speaker of Quahije Chatino uses speech and gesture to locate a nearby town during a data collection walk.



ANECHOIC  
CHAMBER



ARTICULO-  
GRAPHY



LARM  
STUDIO



MOTION  
CAPTURE



EEG



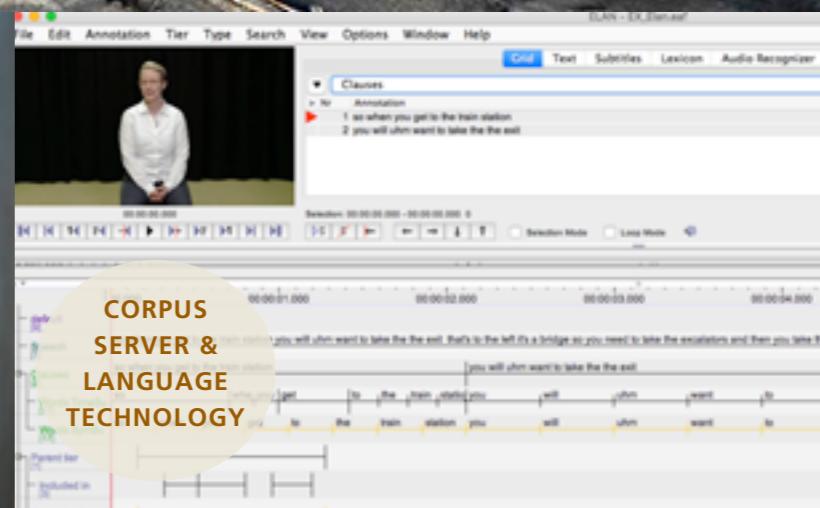
VIRTUAL  
REALITY



BIO PAC



EYE  
TRACKING



CORPU  
SERVER &  
LANGUAGE  
TECHNOLOGY

ject with Pompeu Fabra University started to examine the development of gestures in the story retellings of Italian and Catalan children age six to nine (Graziano, Prieto) (see [Collaborations](#)). M. Gullberg's Wallenberg Scholar project *Embodied bilingualism* also continued to investigate a range of language-gesture pairings, including Swedish, German, English, French, Turkish (Christensen). Another project with the University of Concordia continued to probe the effect of gesture on language learners' ability to understand native Italian speakers by manipulating the presence/absence of gestures (Graziano, Trofimovich). Work also continued on a joint project with University College London examining whether adults can learn any sign language after only a few minutes of exposure and with no training (Marshall, Janke, Hofweber, Aumonier, Gullberg). The first results indicate that adults can indeed recognise signs from a continuous stream of signing. New data were collected online in 2020 to probe acquisition of meaning.

Work with motion capture and virtual reality also continued. A PhD thesis in Cognitive science examined how interlocutors interact with virtual agents created from motion capture recordings (Nirme). Another project continued to examine the synchronisation of head movements and speech using articulography data, motion capture, and acoustic analysis (Frid, Svensson Lundmark, Ambrazaitis, Schötz, House; see also [Text-language resources](#), [Swe-Clarin](#)).

Multimodality also featured in teaching and training. Lab members were involved in teaching a MA course in Linguistics at the Centre for languages and literature, *Visual language* (M. Gullberg, Garde, Graziano, Mesh), which included online tutorials on gesture coding and multimodal analysis. Lab members also contributed to instruction

on methodology for controlled multimodal data collection in naturalistic settings, and mentorship of students of multimodality in Mexico and Guatemala (Mesh). Lab members further supervised international MA and PhD students (Germany, South Africa, Switzerland; Graziano, M. Gullberg), and acted as external examiners of PhD theses on multimodality (Graziano, M. Gullberg, Mesh). Furthermore, a new online seminar series on multimodality, the Gesture seminar, was launched (M. Gullberg organiser), with several Lab members in regular attendance (Frid, Garde, Graziano, Mesh). Eight seminars were held in the autumn semester 2020 with international scholars also attending. In addition, Lab members presented multimodal work at a workshop hosted by the Linneaus Centre *Thinking in time: Cognition, communication and learning, Multimodal interaction: Language, gesture, image* (organised by M. Gullberg, Holsanova, Paradis; Frid, Graziano, M. Gullberg presented).

An international network dedicated to the study of gestures and head movement in language (GEHM), led from the University of Copenhagen, also held several online meetings in 2020 with Lab members as active participants and presenters (M. Gullberg in the steering committee; Graziano, Frid; see [Collaborations](#)).

### KEYSTROKE LOGGING

Keystroke logging is a technique that enables the recording of a writer's keyboard and mouse activities during text production keystroke by keystroke. The writing session can be replayed and analysed in detail to show how the process of writing may differ from the final text. The keystroke logging program ScriptLog has partly been developed by Lab members (Frid, V. Johansson). In 2020, the program was used in an ongoing study combining

writing and picture naming (Meulemans, Frid). A MA thesis in Linguistics used keystroke logging to investigate written language in chats as compared to speaking and more traditional writing. Results show that producing written chats is similar to traditional writing in many ways, but differs from it in terms of planning units (K. Gullberg). Keystroke logging was also used in external collaborations. A collaborative project with the University of Gothenburg used it to investigate writing processes in patients with post-stroke aphasia or low-grade glioma (Johansson-Malmeling, Henriksson, Wengelin, Frid). An-

other collaboration with KU Leuven, Belgium, combined keystroke logging, eye-tracking, and audio recordings to capture and investigate the joint attention of two collaborative writers (V. Johansson, Frid, van Steendam, R. Johansson). Finally, keystroke logging was also demonstrated and used in exercises on several courses at undergraduate and graduate levels in Linguistics and for students in Language Consultancy.

## Collaborations



Lund University Humanities Lab and its members have thriving local, national, and international collaborations and networks as reflected in the image above. Those linked to individual scholars are too numerous to list here, but the Lab also has many institutional collaborations.

**LOCAL.** The Lab has numerous local collaborations across Lund University. Many are longstanding such as with the departments of Linguistics, Archeology, Cognitive science, Design sciences, Biomedical engineering, Biology (cf. [Research](#)), Lund University School of Aviation and UAV@LU, the Strategic Research Area for e-Science eSSENCE, LU Center for Scientific and Technical Com-

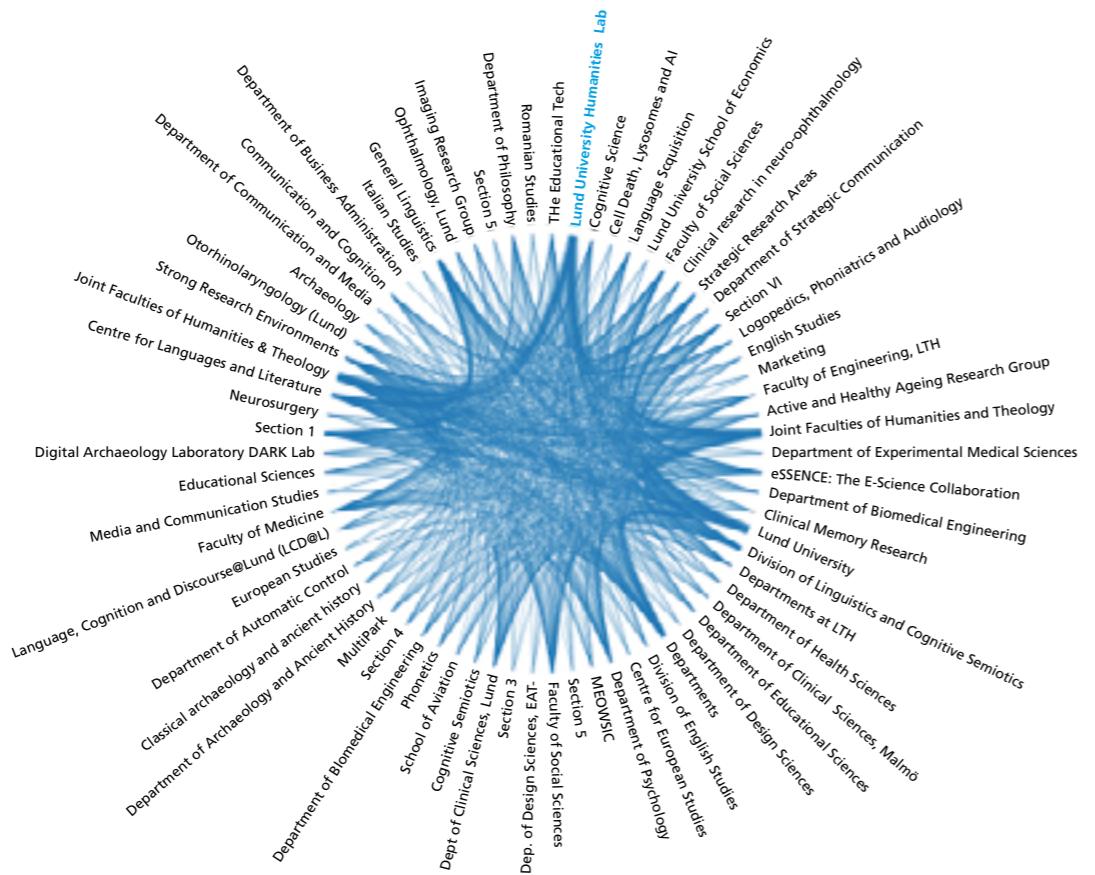
puting (LUNARC), Lund Bioimaging Centre, etc. Recent links, for example with the infrastructure *Correlative Image Processing and Analysis (CIPA)* at the Medical Faculty, were developed in 2020 through joint funding applications. Continuing initiatives also included engagement in a LU Thematic Collaboration Initiative, *Intelligent intelligence* (Political Science, Petterson) where linguistic analyses of how people talk, write, read, and listen were provided by Lab members (V. Johansson, van de Weijer). A related Advanced Study Group at the Pufendorf Institute for Advanced Studies, *In the interest*

*of the nation*, brought together experts from the Lab, Linguistics, Phonetics, Psychology, Intelligence studies, Law, and Human rights studies (Frid, van de Weijer, V. Johansson). A new Advanced Study Group at the Pufendorf Institute started in 2020. The INTERCOM study group focuses on interspecific communication and how humans and other animal species communicate across species boundaries, and brings together experts from the Lab, Psychology, Speech and language pathology, Evolutionary ecology, and Cognitive science (Schötz, van de Weijer, Graziano, Mårtensson). Other new local

activities in 2020 included engagement with the Science Village Scandinavia (SVS) enterprise. M. Gullberg served on a reference group developing a strategy for LU and SVS, while Petersson collaborated with the project team of the SVS Science Centre.

In the domain of e-Science, local collaborations continued (see below under National collaborations), both in terms of projects, and in terms of training, for example with Lab members teaching at events co-organised by the graduate school COMPUTE and the faculty of Social science (Frid; cf. [Training, teaching, consultations](#)). The collaboration with Lund University Bioimaging Centre continued through the liaison officer (Mårtensson) whose task is to facilitate and boost the use of and training in brain imaging techniques. In 2020 Mårtensson developed the course on MRI for participants without a background in medicine, to recruit new users and forge stronger connections between the Humanities Lab and other groups at LU interested in the brain.

**NATIONAL** collaborations were numerous. The Lab is a node in the national consortium *Nationella Språkbanken* and *Swe-Clarin*, itself part of *CLARIN*, the European Common Language Resources and Technology Infrastructure. Swe-Clarin links nine Swedish institutions around issues of language technology, including the *Swedish National Data Service (SND)*. As a national node and an accredited *Knowledge Centre*, the Lab provides tools and expertise related to language archiving, corpus and (meta-)data management, assistance with sensor-based methods, and speech and language technology. The local coordinator (Frid) was involved in a range of projects in 2020 (see [Research](#)) in addition to consulting on issues of language technology. In 2020, the Lab also became a CLARIN Metadata Providing Centre (C-centre). The Lab



also featured in the [Tour de CLARIN](#) series, an initiative within CLARIN which periodically highlights prominent user-oriented activities of CLARIN centres in blog posts published on the CLARIN webpage and in social media.

The Lab also continued its partnership with [eSSSENCE](#), the national Strategic Research Area and programme in e-Science, involving the universities of Uppsala, Lund, and Umeå. The overall enterprise focuses on the development of tools for handling, storing and retrieving research data in digital form. M. Gullberg is a member of the Lund steering committee. Data flows, large databases, heavy data computation, and data visualisation, achieved with the assistance of *LUNARC*, the Lund University Center for Scientific and Technical Computing (M. Gullberg member of the executive board) are core elements. A collaborative project funded by eSSSENCE, aiming to develop a general framework for using Virtual Reality to visualise any 3D data set was completed in 2020 (Lindgren). Lab members regularly contributed to [COMPILE](#), a common web site for research, education,

and infrastructure related to Science and e-Infrastructure at Lund University.

A new link was also forged with the Strategic Research Area [ELLIT](#) on information technology and mobile communications, where M. Gullberg became a member of the steering committee in 2020. ELLIT is a partnership between Linköping, Lund, Halmstad and Blekinge Universities.

The Lab also continued its collaborations with other infrastructures following the joint bid to the Swedish Research Council's call for a Needs Inventory of Research Infrastructure of National Interest in 2019. The joint bid with [Humlab Umeå](#) was one of only 10 bids to be ranked as a research infrastructure of national interest ("A1"). The Lab was also part of one other successful bid, a National Research Infrastructure for Visualisation of Data (*InfraVis*) led by Chalmers University of Technology with other LU members being Astronomy and Design Sciences.

**INTERNATIONAL.** The Lab has several longstanding international collaborations. For example, in the field of 3D scanning, the Lab has several collaborations through its members (Lindgren, C. Larsson, Landeschi), including with the *Swedish Institute in Athens*, *CNR-ISTI* in Pisa, and *Institute of Heritage Science* in Rome. In the domain of eye-tracking, long-standing collaborations with universities in the Netherlands, Germany, and Finland continued to flourish and involved training and research activities in 2020, but now online. In the area of language documentation, data management and corpora, the long-standing collaboration continued with the *Max Planck Institute for Psycholinguistics and The Language Archive* (TLA) hosted there. The Language Archive deve-

lops software and archiving solutions for the Humanities and languages in particular. Continued connections to the *Endangered Languages Archive* at the School of Oriental and African Studies at the University of London also continued, as well as connections within CLARIN ERIC. In the domain of multimodality, the international network *Gesture and Head Movements in Language (GEHM)*, funded by the Independent Research Fund Denmark (Paggio), continued its work with online working meetings linking the Universities of Copenhagen, Lund, Linnaeus, KTH, Leuven, Kiel, Barcelona, and Trinity College Dublin.

Moreover, the Humanities Lab is a partner in a number of international centres such as the *Centre for Multilingualism in Society across the Lifespan*, Oslo; and *DigHumLab* Denmark, the Danish national consortium for digital humanities. Annual meetings normally held on site moved online and to digital formats and video conferencing. In 2020, the fifth conference of the association of Digital Humanities in the Nordic Countries (DHN) was held in Latvia and online, and Lab members attended and presented work there (V. Johansson; see [Outreach](#)).

Normally, the Humanities Lab hosts many visiting scholars from all over the world for both short- and long-term stays. Lab members normally also visit other institutions and give invited talks about their own research both within and outside Lund University. In 2020, all such visits were cancelled due to covid-19 restrictions. However, exchange with our international colleagues intensified online via video conferencing. These online forms of exchange seem likely to continue even after travel restrictions linked to the pandemic are lifted.

## NEW LAB MEMBERS 2020

Three new Lab Members were recruited in 2020 to work in the project THE LANG-TRACK-APP: Studying exposure to and use of a new language using smartphone technology (Granfeldt, Gullberg). This project investigates when, where, and how people use languages other than their first language in everyday life. For this purpose, a smartphone app has been developed, prompting language learners to answer questions several times per day about their language use. In a first study the LANG-TRACK-APP was used to examine the behaviour of university students studying abroad. Despite the restrictions imposed by covid-19, data could successfully be gathered. A second study will focus on the role of Swedish in the lives of new arrivals to Sweden.



**HENRIETTE ARNDT | Postdoctoral Fellow**

I am an applied linguist who researches how people learn languages outside of formal language classes or programs. I am particularly interested in the role that new technologies and popular culture play in motivating learners to use their second language during their leisure time. I primarily work on the content-side of the LANG-TRACK-APP project, designing the surveys which we send out via the app, working with our study participants, analysing data, and describing our findings.



**JOSEF GRANQVIST | Software Developer**

I am a software engineer who, despite developing several language learning apps, seem immune to learning new languages myself. In the LANG-TRACK-APP project, I build the backend services that anonymously collect survey data from the app, and the administrator webpage where the researchers can enter and schedule surveys for the study participants in the LANG-TRACK-APP.



**STEPHAN BJÖRCK | App Developer**

I have been developing native apps for iOS and Android for the past five years. My task in this project is to develop the LANG-TRACK-APP for App Store and Google Play store and to ensure that the apps can present the language surveys and communicate the participants' responses to the backend that Josef built.

## Training, teaching, consultations

Training constitutes an important part of the Lab's activities. Training activities include PhD courses, group tutorials, individual and group consultations, and guest lectures. These are adjusted according to topics, needs, and audiences. The goal is to facilitate and increase users' access to the technological resources that require advanced methodological skills, and to enable interdisciplinary work within and across faculties. Throughout the year, Lab members are engaged in a number of training activities in areas such as eye-tracking, visualisation of 3D data, programming, audio and video recording, statistics for the behavioural sciences, and data geo-referencing. In 2020, pedagogical activities were obviously affected by the pandemic situation. Since activities could not be held on site, the Lab offered courses and tutorials on-line wherever possible.

The PhD courses run over a number of weeks, and focus both on broad methodological approaches such as programming or statistics, and on specific research technologies, such as eye-tracking. Courses normally include practical hands-on elements as well as theoretical and methodological components. In 2020, the Lab offered 4 courses of this type, one on programming for the behavioural sciences (Nyström), one on functional and structural brain imaging (Mårtensson), and two on statistics (I and II; van de Weijer). In total, 47 participants took part in the courses, representing subjects such as General linguistics, English, Cognitive semiotics, Philosophy, Psychology, Cognitive science, Social science, Physiotherapy, Political science, and Medical science at LU.

Group tutorials were offered on several topics in 2020, mostly in online form. The 11 tutorials included topics such as *Mining text with quantitative methods* (Frid), audio and video recording in the LARM studio (Roslund), screen-based eye-tracking and mobile eye-tracking (Niehorster), GPS and data geo-referencing (Landeschi), the motion capture system (Garde), an introduction to R Studio (van de Weijer), and text mining (Frid). The tutorials had more than 60 participants from SLU at Alnarp, the SAXO institute in Copenhagen, Media and communication studies, Practical philosophy, History of ideas and sciences, Arts and cultural sciences, the faculty of Social sciences, and the faculty of Medicine at Malmö University and from Copenhagen Business School.

Individual and group consultations are also important training activities. They offer Lab users targeted advice on specific research problems and are often related to the use of specific software, technologies or analysis methods. In 2020 Lab members provided 82 such consultations, 26 of them online. Areas covered included statistical and methodological advice (van de Weijer), Excel carpentry (Frid), text-speech alignment and parts-of-speech-tagging (Frid), analyses of articulatory data (Frid), eye-tracking (Niehorster, Nyström), Virtual Reality video (Roslund), podcast recording (Roslund), audio and video recording and editing (Roslund), EEG scripts (Garde), VR visualisation (Garde), VR experimental setup and recording (Garde), mocap setup and recording (Garde, C. Larsson, Lindgren), EEG python scripts (Garde), and perception experiments (Garde). Consultations were also provided on the softwares R (van de Weijer), ELAN

(Graziano, Garde), PRAAT (Frid), Java (Garde), Psychopy (Garde).

Importantly, the Lab was also consulted on strategic and practical issues concerning the building of infrastructures, for example by the Medical faculty at LU and the Forum Medicum Movement and Reality Lab (MoReLab).

Lab members also took part in other teaching activities, organized by other units at LU and elsewhere. This includes an online lecture on Psychopy at the University of Copenhagen (Garde), three online tutorials in E-prime at the Nicolaus Copernicus University in Torún, Poland

(van de Weijer), a tutorial on BioPac at University of Southern Denmark (van de Weijer), Phonetics for Speech and language pathology (van de Weijer), and Excel for Language consultancy (van de Weijer). Lab members also taught courses on Neuromodeling, cognitive robotics and agents, on Cognition, learning and advanced technologies, both given in collaboration by Cognitive Science and Design Science (Niehorster); on Psycholinguistics at the Centre for Languages and Literature (van de Weijer), and a master course in Statistics in Cognitive Science (van de Weijer). Other Lab members taught a MA course on multimodality in Language sciences (M. Gullberg, Garde, Graziano, Mesh).

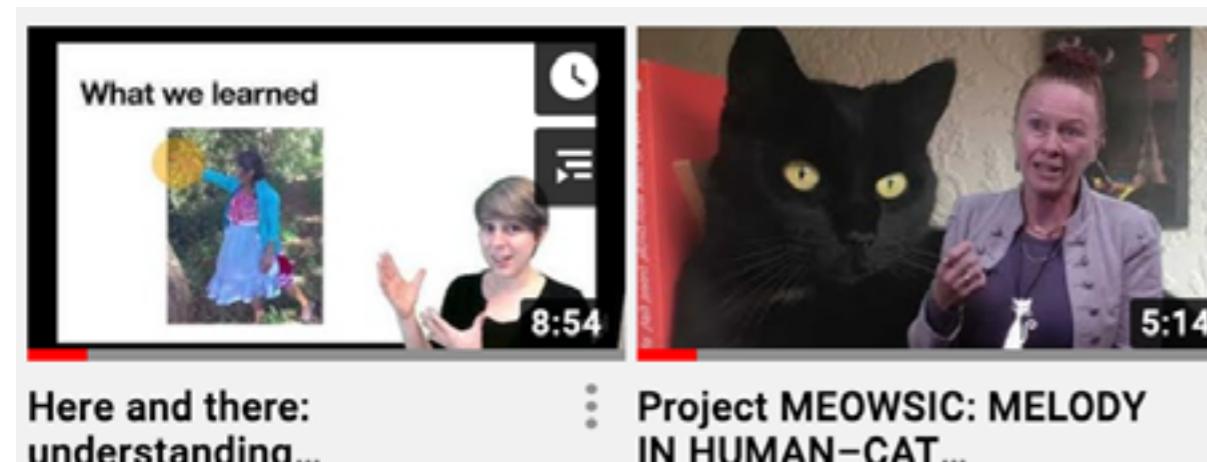


## Visibility, access, outreach

Every year, the Humanities Lab hosts multiple events for local, national and international visitors across a range of domains. The pandemic in 2020 changed the nature of the regular engagements, but many tours and demos were transformed into online events. In 2020 a total of **11** demos were organized, six of which were online. These gave an overview of the research facilities and the on-going research, often adapted for the targeted audiences and purposes. Virtual Lab tours in 2020 included presentations as part of Lund University's arrangement *Framtidsveckan* (Future week, Graziano). Recipients also included the Royal Swedish Academy of Sciences (Gullberg), members of the LU Thematic collaboration initiative *Intelligent Intelligence*, including members from Political science and external organisations and authorities (V. Johansson). Virtual tours were also offered as part of the European University Alliance for GLObal Health, *EUGLOH*, and their Alliance Day 2020, organised by LU with partner universities (Université Paris-Saclay,

France; University of Szeged, Hungary; University of Porto, Portugal; and Ludwig-Maximilian Universität of Munich, Germany) (V. Johansson). Further, Lab members also gave virtual demos for students from Logopedics, phoniatrics and audiology (Schötz), Arts and cultural sciences (Roslund), and the Centre for theology and religious studies (Graziano).

The Humanities Lab further participated in events in both academic and popular contexts. Many of the talks demonstrated technologies and activities in the Lab, as well as research. For instance, the Lab participated with Youtube-films at the annual event Future week (*Framtidsveckan*) organised by LU. This included the film "‘Here’ and ‘there’: How a partnership between Sweden and Mexico is helping us to understand communication about space" (Mesh), and the film and the quiz "Are you a future cat whisperer?" (Schötz, van de Weijer).



Further, Lab members gave invited talks on mobile eye-tracking (Niehorster), whether Italians really gesture more than others or in a different way (Graziano, M. Gullberg), on the interplay between speech and gesture in children's language development (Graziano), on various topics on bilingualism and language acquisition (Gullberg). Talks also included topics such as out-of-school exposure for young language learners (van de Weijer), a new resource for Swedish Named-Entity Recognition (Frid), and on the sustainability of digital research data at a Conference for Digital Humanities in the Nordic Countries (V. Johansson).

Lab members also appeared in the media (see text box). For example, members were interviewed in national newspapers on adult language learning and on gestures (*Dagens Nyheter*, *Svenska Dagbladet*; M. Gullberg), and an article in Reader's Digest mentioned research on cat vocalization (Schötz). Lab members also participated in podcasts, for example on the importance of language for being human, and on the power of the adult language learning capacity (M. Gullberg), and on writing development (V. Johansson). Lab members also appeared on Swedish national television talking about cat vocalisations (Schötz) and about handwriting (V. Johansson).

Finally, the Lab communicated about activities on its website and social media (Facebook, Twitter) with regular updates on research, events, grants, and awards. The Lab's YouTube channel had more than 700 views of video material in 2020. The Lab's website was also updated and re-organized to follow new rules for so-called web accessibility. The website now exists in both English and Swedish. Information about policies, access, user agreements, participation in experiments, etc., are available on the web.

### IN THE MEDIA

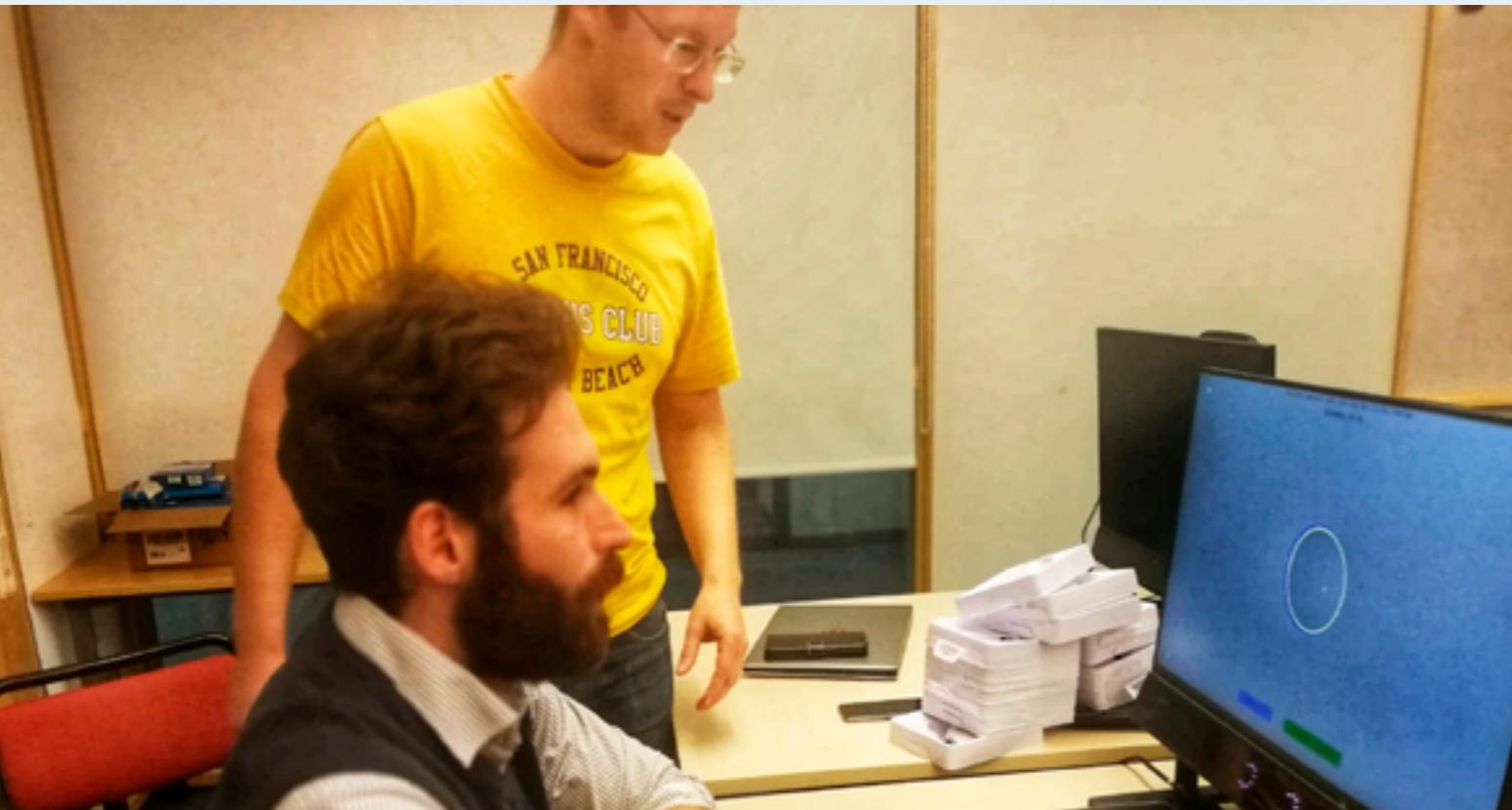
- January 9, 2020  
National newspaper, *Dagens Nyheter*  
Marianne Gullberg
- January 29, 2020  
*Reader's Digest*  
Susanne Schötz
- March 5, 2020  
National newspaper, *Svenska Dagbladet*  
Marianne Gullberg
- June 9, 2020  
Podcast *Mycket hjärna*  
Victoria Johansson
- October 17, 2020  
Swedish National Television, *SVT Nyheter*  
Susanne Schötz
- November 26, 2020  
Swedish National Television, *Utbildningsradion: Skolstudion*  
Victoria Johansson
- November 26, 2020  
Podcast from The New Society of Letters at Lund  
Marianne Gullberg
- November 26, 2020  
The SCAS talks podcast  
Marianne Gullberg

# User projects

## HOW DISAGREEMENT IN FACEBOOK COMMENTS AFFECTS USER ENGAGEMENT WITH NEWS

Anamaria Dutceac Segesten, Centre for Languages and Literature, Lund University | Michael Bossetta, Media and Communication, Lund University | Nils Holmberg, Strategic Communication, Lund University | Diederick Niehorster, Lund University Humanities Lab, Lund University

This project combined surveys with an eye-tracking experiment in which 96 participants were exposed to



20 Facebook news posts from the newspaper *Aftonbladet*. Participants were shown a pair of comments either agreeing or disagreeing with one another. Findings suggest that disagreement increased users' visual attention to comments, decreased their likelihood to share the post, and had no effect on their likelihood to read the news article associated with the post.



## TOWARDS OBJECTIVE AND QUANTIFIABLE TESTS FOR ADHD AND ASD

Anders Rasmussen, Experimental Medical Science, Lund University | Peik Gustafsson, Child and Adolescent Psychiatry, Lund University | Joakim Eriksson, Virtual Reality Laboratory, Lund University | Katarina Kjell, Department of Psychology, Lund University | Carolina Larsson, Lund University Humanities Lab, Lund University

This project aims to develop new objective and quantitative tools for investigating and potentially also improve diagnostic tools for ADHD and ASD. For this purpose,

## RAPID NEURAL PROCESSING OF GRAMMATICAL TONE IN SECOND LANGUAGE LEARNERS

Sabine Gosselke Berthelsen, Centre for Languages and Literature, Lund University

This PhD project investigated how quickly people can acquire words and grammar from a previously unknown language. Using behavioural measures and EEG recordings, it demonstrated that overt learning happens within minutes but that learners rely on different neural processes depending on their language background. The more familiar they are with the novel words' form and function, the more automatically and effortlessly they assess them. Thus, while language learning may overtly seem unaffected by the learners' background, previous language history seems to dictate how well the new language can initially be integrated into the learners' neural systems.

VR is used to develop a motor test battery where participating children will enter a virtual environment where they will be guided through tests by an animated avatar. Compared to traditional tests, this has the benefit of being fun for the children, which minimizes the risk that poor performance is due to the children being bored. Another advantage is that all children receive the same instructions, and that quantitative and objective data can be collected.

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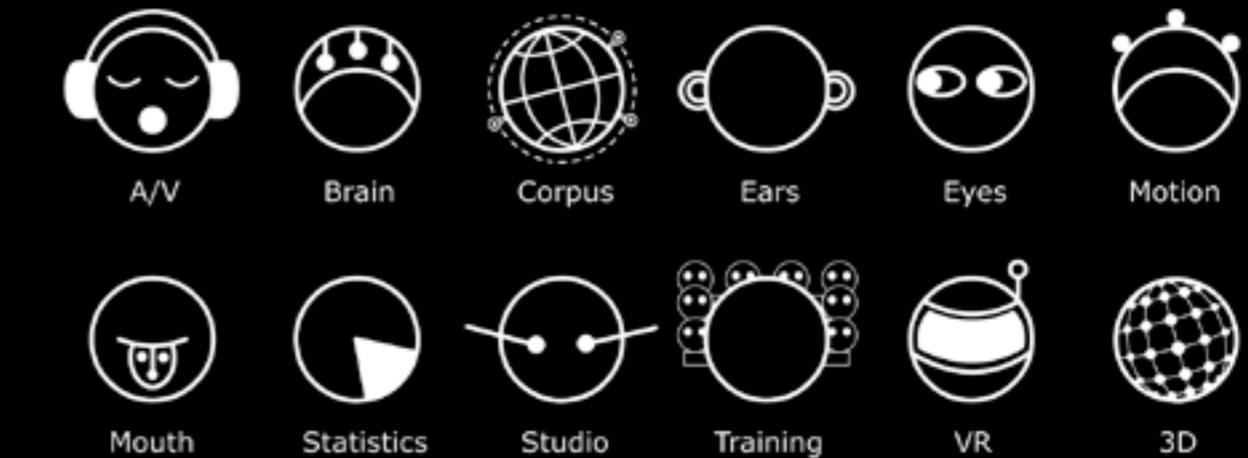
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*The PDF version contains hyperlinks  
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